

Safety & Buildings Division  
201 West Washington Avenue  
P.O. Box 2658  
Madison, WI 53701-2658

## Wisconsin Building Products Evaluation

Material

Metal Building Systems

Manufacturer

American Buildings Company  
1150 State Docks Road  
Eufaula, Alabama 36027

### SCOPE OF EVALUATION

**GENERAL:** This report evaluates the use of the Pre-Engineered Metal Building Systems: LRF, RF, LRF-M, GC, LT, LP2, LP2-M, SB, LP4, LP4-M, LSS, LSS-M, SSF, EW and HW Series, manufactured by American Buildings Company, through a review of structural performance.

This review includes the cited **Comm** code requirements below in accordance with the current **Wisconsin Building and Heating, Ventilating and Air conditioning Code:**

- **Structural:** The LRF, RF, LRF-M, GC, LT, LP2, LP2-M, SB, LP4, LP4-M, LSS, LSS-M, SSF, EW and HW Series were evaluated in accordance with ss. **Comm 53.10, 53.11, 53.12, 53.16, 53.50, 53.511, and 53.53.**

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This review includes the cited **International Building Code (IBC)** requirements below in accordance with the **Wisconsin Amended IBC Code (effective 7/01/02):**

- **Structural:** The LRF, RF, LRF-M, GC, LT, LP2, LP2-M, SB, LP4, LP4-M, LSS, LSS-M, SSF, EW and HW Series were evaluated in accordance with ss. **IBC 1603.1, 1604.1, 1604.2, 1604.3.1, 1604.3.3, 1604.4, 1604.5, 1605.1, 1606 through 1609, 2208.1 [Comm 62.2208], 2209.1, 2209.2 and 2211.5.**

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## **DESCRIPTION AND USE**

**General:** All buildings are fabricated from 55 ksi minimum yield strength steel for main members. The frame design requires lateral support of the compression flange and is provided by connecting angles to the webs of purlins or girts so that the flange compressive stress is within allowable limits for any combination of loading.

Roof purlins and wall girts are designed as continuous members and have a minimum yield point of 55 ksi. Purlin and girt spacing and size is dependent on collateral loading (3psf).

The following modifications are required to satisfy the full snow load requirement on end spans of continuous purlins and one half snow load on the interior spans in accordance with **s. Comm 53.11(4)(c)** of the current Wisconsin Administrative Code.

EW Series: Zone 2 with 3 psf collateral = 25' bays  
 End bay purlins change from 8Z, 14 Ga. to 8Z, 12 Ga.  
 HW Series: Zone 1 with 3 psf collateral = 20' bays  
 End bay purlins change from 8Z, 16 Ga. to 8Z, 14 Ga.  
 All other 25' and 20' bays stay the same.

The EW, HW and RF Series, clear span rigid frame 4:12 roof slope have been checked for full snow load on the leeward side and one half load on the windward side in accordance with the current **Wisconsin Building and Heating, Ventilating and Air Conditioning Code**: RF 12030-25, RF 8020-25, and RF 3010-25.

| <b>Model and Description</b>  | <b>Roof Slope</b>   | <b>Clear Spans</b> | <b>Eave Heights</b> | <b>Bay Spacing (Max)</b> |
|---|---------------------|--------------------|---------------------|--------------------------|
| 1. <b>LRF</b> clear span rigid frame  | 1:12                | 30'-160'           | 10'-30'             | 25'                      |
| 2. <b>RF</b> clear span   |                     | 4:12               | 30'-120'            | 10'-30'                  |
| 25'   |                     |                    |                     |                          |
| 3. <b>LRF-M</b> single gable, multiple span rigid frame with 1 or more interior columns           | 1:12                | 80'-500'           | 14'-30'             | 25'                      |
| 4. <b>GC</b> , clear span tapered girder on column frame with moment connections for continuity   | 1:12                | 30'-80'            | 10'-24'             | 25'                      |
| 5. <b>LT</b> , lean-to, tapered girder on column with simple connections                          | 12:12<br>or<br>4:12 | 10'-60'            | 10'-24'             | 25'                      |
| 6. <b>LP2</b> , clear span, tapered girder on column frame with moment connections for continuity | 1/2:12              | 20'-70'            | 10'-24'             | 25'                      |
| 7. <b>LP2-M</b> single gable, multiple span rigid frame with 1 or more interior columns           | 1/2:12              | 50'-500'           | 14'-24'             | 25'                      |
| 8. <b>SB</b> , clear span, prismatic frame  | 1/4:12              | 24'                | 12'                 | 25'                      |

|     |  |        |          |          |     |
|-----|--|--------|----------|----------|-----|
| 9.  | <b>LP4</b> clear span rigid frame                          | 1/4:12 | 20'-60'  | 24' max. | 25' |
| 10. | <b>LP4-M</b> single gable, multiple<br>span rigid<br>frame | 1/4:12 | 50'-500' | 24'      | 25' |
| 11. | <b>LSS</b> low profile single slope                        | 1/4:12 | 50'-160' | 24'      | 25' |
| 12. | <b>LSS-M</b> single slope rigid frame                      | 1/4:12 | 50'-320' | 24'      | 25' |
| 13. | <b>SSF</b> single slope flush framed<br>clear<br>span      | 1/4:12 | 20'-60'  | 20'      | 25' |

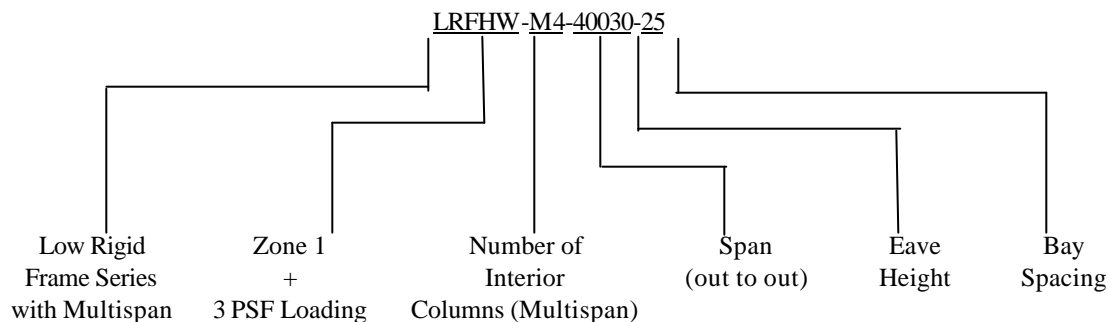
The load combination, DL+1/2LL+LL, without the wind load, requires the ridge rafters to be changed to the next flange thickness for the 120' and 80' span frames. The 30' span does not require any change.

End walls consist of end wall roof beams and columns of either mill-rolled sections of A36 or A50 steel or built-up "I" sections of 55 ksi steel or cold formed sections of 55 ksi steel.

Wind bracing is provided by using diagonal rods or cables in the roof and walls.

Roof and wall coverings consist of 26 and 24 gauge galvanized steel panels or aluminum coated panels.

The building models are identified as follows:



HW Series: Zone 1 with 3 psf collateral load  
 EW Series: Zone 2 with 3 psf collateral load  
 H\* Series: Zone 2 without 3 psf collateral load  
 E\* Series: Zone 2 without 3 psf collateral load

**\*Note:** The "H" and "E" series may be used only when the project owner submits a written application for waiver of the 3 psf service equipment load (Collateral load).

## TESTS AND RESULTS

Weld test data has been submitted satisfying **s. Comm 53.53(10)** of the current WI Building Code **Comm** requirements.

## CALCULATIONS

All primary steel, built-up sections are manufactured from 55 ksi minimum yield steel, all hot rolled sections from 36 or 50 ksi minimum yield steel, designed in accordance with current AISI or AISC Specifications, whichever is applicable.

The design and assembly of structural joints and connections (primary and secondary steel) using high strength steel bolts conform to the "Specification for Structural joints Using ASTM A325 and A307 Bolts" approved by the Research Council on Structural Connections of the Engineering Foundation.

All secondary structure is designed in accordance with current AISI or AISC Specifications, whichever is applicable.

All cladding material is designed in accordance with the 1986 edition of the "Specifications for Design of Light Gauge Cold Formed Steel Structural Members"-AISI with 1989 addendum.

### **LIMITATIONS OF APPROVAL**

Building Code Applicable to Projects Submitted for Review Prior to July 1, 2002: The **Comm** limitations below are in accordance with the current **Wisconsin Building and Heating, Ventilating and Air Conditioning Code**:

The approval number permits plan submittal without repetitious structural calculations. This approval is for uniform loading condition only. Any special concentrated loading condition is not included under this approval number and requires complete structural calculations.

Buildings shall be located in a zone of the state consistent with their roof load design and **s. Comm 53.11(4)**.

This approval is not for a specific building, but rather an approval of the building design concept. The metal buildings must be constructed in accordance with the sample calculations (design concept) and details on file with the department.

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The **IBC** limitations below are in accordance with the **Wisconsin Amended IBC 2000 Code (effective 7/01/02)**:

The approval number permits plan submittal without repetitious structural calculations. This approval is for uniform loading condition only. Any special concentrated loading condition is not included under this approval number and requires complete structural calculations.

**NOTE: Structural calculations shall be submitted in accordance with IBC Chapter 16 (Live, Ground Snow, Roof, Wind, Collateral, and Seismic Loads).**

This approval is not for a specific building, but rather an approval of the building design concept. The metal buildings must be constructed in accordance with the sample calculations (design concept) and details on file with the department.

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### **INFORMATION REQUIRED ON PLANS SUBMITTED FOR APPROVAL**

This evaluation number, member properties, size of all members, layout and other general requirements of **s. Comm 50.12** and **s. Comm 61.30** must be indicated on each plan submittal. **NOTE: Member sizes may be shown in the building plan submittal or subsequent component plan submittal.**

The location and sizes or critical dimensions of all major structural members (rigid frames, columns, beams, end walls, etc.) must be shown. This must include the web and flange sizes at the base, haunch, ridge, and any other location where member sizes change.

Foundation plans (by others) must show details of footings as well as anchor bolt sizes and side thrust restraint when required.

The size and spacing of purlins and girts must be shown on a cross-section or on roof and elevation framing plans.

The size and location of all diagonal bracing must be shown.

Thermal performance requirements shall comply with the cited **Comm** code requirements in accordance with the current **Wisconsin Building and Heating, Ventilating and Air conditioning Code**:

- the requirements of **s. Comm 63.16** and **63.17**.

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Thermal performance requirements shall comply with the cited **International Building Code (IBC)** requirements below in accordance with the **Wisconsin Amended IBC Code (effective 7/01/02)**:

- the requirements of **ss. IMC 301.1** and **302.1, 702.1 [Comm 63.0701]** and **Chapter 8**.

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This approval will be valid through December 31, 2007, unless manufacturing modifications are made to the product or a re-examination is deemed necessary by the department. The Wisconsin Building Product Evaluation number must be provided when plans that include this product are submitted for review.

### **DISCLAIMER**

The department is in no way endorsing or advertising this product. This approval addresses only the specified applications for the product and does not waive any code requirement not specified in this document.

Revision Date:

Approval Date: July 1, 2002

By: \_\_\_\_\_

Lee E. Finley, Jr.  
Product & Material Review  
Integrated Services Bureau

